

SARDAR PATEL UNIVERSITY
M.Sc. (Chemistry) Semester-II Examination
Tuesday, 19th November 2019
Organic Chemistry-II: PS02CCHE02

Time: 10:00 A.M. to 01:00 P.M.

Marks: [70]

Note: Right hand figures indicate marks

Q-1 Select the correct answer from the option given below. [08]

1. Betaine is an intermediate in _____.
 (a) Stork enamine reaction (b) Wittig reaction (c) Robinson annulation (d) Birch reduction
2. Oppenauer oxidation is the reverse process of _____.
 (a) Clemmensen reduction (b) Wolff-Kishner reduction
 (c) M.P.V reduction (d) Rosenmund reduction
3. Which of the following hydroborating reagents is bifunctional hydroborating reagent?
 (a) Catechol borane (b) 9-BBN (c) Diisopinocampheyl borane (d) Thexyl borane
4. Which of the following gives a tertiary alcohol when treated with Grignard reagent?
 (a) HCHO (b) CH₃CHO (c) C₃H₅CHO (d) CH₃COCH₃
5. Which of the following reactions is used for selective alkylation of aldehydes and ketones?
 (a) Stork-enamine reaction (b) Robinson annulation (c) Wittig reaction (d) None of them
6. Use of the protic solvent in Bamford-Stevens reaction produces _____ as intermediate.
 (a) carbene (b) carbocation (c) carbanion (d) free radical
7. IUPAC name of 15-crown-5 is _____.
 (a) 1,4,7,10,13,16-hexaoxocyclooctadecane (b) 1,4,7,10-tetraoxocyclododecane
 (c) 1,4,7,10,13,16,19-heptaoxocycloheptadecane (d) 1,4,7,10,13-pentaoxocyclopentadecane
8. Zn-Hg/HCl reagent is used in _____.
 (a) Cannizaro reduction (b) Clemmensen reduction
 (c) M.P.V reduction (d) Wolff-Kishner reduction

Q-2 Answer Any Seven the following. [14]

1. Why Wittig reaction should be performed under dry and inert condition?
2. Why enamine preparation requires dehydrating conditions?
3. Write the characteristics of a good oxidizing agent.
4. Write the synthesis of 9-BBN and Thexyl borane.
5. Write the advantages and limitations of Jones's reagent.
6. Define the terms 1. Atom economy 2. E-factor
7. How the use of microwave is better than conventional method of heating?
8. Why ether solvents are used in the Grignard reaction?
9. How will you prepare cyclobutanone using 1,3-dithiane?

Q-3 [A] Answer the following. [06]

1. Explain the Schlosser modification.
2. Comment on stereochemical outcome of Wittig reaction using non stabilized yield.

[B] Answer the following. [06]

1. What is Robinson annulation and give its importance.
2. Why 2° amines are more preferred over 1° amines in stork enamine reaction?

OR

[B] Answer the following. [06]

1. Why Horner Emmons reaction is more advantageous than Wittig reaction?
2. Highlight the use of DCC in amide formation and ester formation.

Q-4 [A] Answer the following. [06]

1. Give the detailed mechanism of Shapiro reaction.
2. Show that carbonylation of organoboranes is an excellent synthesis tool for the preparation of variety of organic compounds.

[B] Answer the following. [06]

1. Justify the following statement "E-crotonyl borane reacts with an aldehyde to yield an anti-homoallylic alcohol".
2. What are the differences in the reactivity of internal and terminal alkynes in hydroboration reactions?

OR

[B] Write a note on [06]

1. Peterson olefination reaction
2. Bomford-Stevens reaction

Q-5 [A] Answer the following. [06]

1. What is the difference between the reactivity of Gilman and Grignard reagents towards α,β -unsaturated aldehyde?
2. Discuss the probable mechanism of alkene reduction using Wilkinson catalyst.

[B] Answer the following. [06]

1. Write the mechanism of Swern oxidation.
2. Explain distereoselectivity observed in addition of PhMgBr to 3R-methyl-2-pentanone by using Cram's rule.

OR

[B] Answer the following. [06]

1. Give the mechanism of allylic bromination using NBS.
2. Hydroxylation of cis-2-butene using iodine/silver benzoate under wet condition.

Q-6 [A] Answer the following. [06]

1. How do LiAlH_4 and NaBH_4 differ from each other in their reactivity?
2. What is Wolf-Kishner reduction? Explain its mechanism.

[B] Answer the following. [06]

1. Discuss the reaction mechanism of Meerwein Pondroff Verley reduction.
2. Write down any three principles of green chemistry.

OR

[B] Answer the following. [06]

1. Why KMnO_4 oxidation in the presence of 18-Crown-6 is superior to routine method?
2. What are the phase transfer catalysts? Give their advantages.